What is claimed is:

1. An isolated antibody or antigen-binding fragment thereof that specifically binds cell surface-expressed ASIC1 (SEQ ID NO:401).

2. The antibody or antigen-binding fragment of claim 1, wherein the antibody or antigen-binding fragment thereof specifically binds cell surface-expressed ASIC1 with an EC_{50} of 1 nM or less as measured using fluorescence activated cell sorting (FACS).

3. The antibody or antigen-binding fragment of claim 1 or 2, wherein the antibody or antigen-binding fragment thereof inhibits acid-induced, ASIC1-mediated ion currents in cells expressing human ASIC1.

4. The antibody or antigen-binding fragment of claim 3, wherein the antibody or antigen-binding fragment thereof inhibits acid-induced cellular calcium flux in cells expressing ASIC1 at pH of about 5.0 to about 6.0 with an IC_{50} of 6 nM or less as measured using a FLIPR assay.

5. The antibody or antigen-binding fragment of claim 3, wherein the antibody or antigen-binding fragment thereof inhibits acid-induced ion currents at pH of about 5.0 to about 6.0 with an IC_{50} of 10 nM or less as measured using a patch-clamp assay.

6. An isolated antibody or antigen-binding fragment thereof that competes for binding to cell surface-expressed ASIC1 with a reference antibody comprising an HCVR/LCVR sequence pair selected from the group consisting of SEQ ID NOs: 2/10; 34/42; 50/58; 66/74; 114/122; 130/138; 146/154; 162/170; 194/202; 210/218; 242/250; 258/266; and 274/282.

7. The antibody or antigen-binding fragment of claim 6, wherein the antibody or antigen-binding fragment thereof inhibits acid-induced ASIC1-mediated ion currents in cells expressing human ASIC1.

8. An isolated antibody, or antigen-binding fragment thereof, that specifically binds cell surface-expressed ASIC1 (SEQ ID NO:401), wherein the antibody or antigen-binding fragment comprises: (a) the complementarity determining regions (CDRs) of a heavy chain variable region (HCVR) having an amino acid sequence selected from the group consisting of SEQ ID NOs: 2, 34, 50, 66, 114, 130, 146, 162, 194, 210, 242, 258, and 274 ; and (b) the CDRs of a light chain variable region (LCVR) having an amino acid sequence selected from the group consisting of SEQ ID NOs: 10, 42, 58, 74, 122, 138, 154, 170, 202, 218, 250, 266, and 282.

9. The isolated antibody or antigen-binding fragment of claim 8, wherein the antibody or antigen-binding fragment comprises the heavy and light chain CDRs of a HCVR/LCVR amino

acid sequence pair selected from the group consisting of: SEQ ID NOs: 2/10; 34/42; 50/58; 66/74; 114/122; 130/138; 146/154; 162/170; 194/202; 210/218; 242/250; 258/266; and 274/282.

10. The isolated antibody or antigen-binding fragment of claim 8, wherein the antibody or antigen-binding fragment comprises HCDR1-HCDR2-HCDR3-LCDR1-LCDR2-LCDR3 domains, respectively, selected from the group consisting of: SEQ ID NOs: 4-6-8-12-14-16; 36-38-40-44-46-48; 52-54-56-60-62-64; 68-70-72-76-78-80; 116-118-120-124-126-128; 132-134-136-140-142-144; 148-150-152-156-158-160; 164-166-168-172-174-176; 196-198-200-204-206-208; 212-214-216-220-222-224; 244-246-248-252-254-256; 260-262-264-268-270-272; and 276-278-280-284-286-288.

11. An isolated antibody, or antigen-binding fragment thereof, that specifically binds cell surface-expressed ASIC1 (SEQ ID NO:401), wherein the antibody or antigen-binding fragment comprises: (a) a heavy chain variable region (HCVR) having an amino acid sequence selected from the group consisting of SEQ ID NOs: 2, 34, 50, 66, 114, 130, 146, 162, 194, 210, 242, 258, and 274; and (b) a light chain variable region (LCVR) having an amino acid sequence selected from the group consisting of SEQ ID NOs: 10, 42, 58, 74, 122, 138, 154, 170, 202, 218, 250, 266, and 282.

12. The isolated antibody or antigen-binding fragment of claim 11, wherein the antibody or antigen-binding fragment comprises a HCVR/LCVR amino acid sequence pair selected from the group consisting of: SEQ ID NOs: 2/10; 34/42; 50/58; 66/74; 114/122; 130/138; 146/154; 162/170; 194/202; 210/218; 242/250; 258/266; and 274/282.

13. A pharmaceutical composition comprising the antibody or antigen-binding fragment of any one of claims 1 to 12 and a pharmaceutically acceptable carrier or diluent.

14. A pharmaceutical composition comprising the antibody or antigen-binding fragment of any one of claims 1 to 12 for use in treating or attenuating pain in a human patient.

15. The pharmaceutical composition of claim 14, wherein the pain is nociceptive pain or visceral pain.

16. The pharmaceutical composition of claim 15, wherein the pain is associated with a condition selected from the group consisting of inflammation, post-operative incision, neuropathy, bone fracture, burn, osteoporotic fracture, bone cancer, gout, migraine headache, and fibromyalgia.

17. The pharmaceutical composition of claim 14, wherein the pain is cancer-associated pain or chemotherapy-induced pain.

18. A method for treating or attenuating pain, the method comprising administering to a patient in need thereof an antibody or antigen-binding fragment thereof that specifically binds cell surface-expressed ASIC1 (SEQ ID NO:401).

19. The method of claim 18, wherein the antibody or antigen-binding fragment thereof comprises the heavy and light chain CDRs of a HCVR/LCVR amino acid sequence pair selected from the group consisting of: SEQ ID NOs: 2/10; 34/42; 50/58; 66/74; 114/122; 130/138; 146/154; 162/170; 194/202; 210/218; 242/250; 258/266; and 274/282.

20. The method of claim 19, wherein the antibody or antigen-binding fragment thereof comprises HCDR1-HCDR2-HCDR3-LCDR1-LCDR2-LCDR3 domains, respectively, selected from the group consisting of: SEQ ID NOs: 4-6-8-12-14-16; 36-38-40-44-46-48; 52-54-56-60-62-64; 68-70-72-76-78-80; 116-118-120-124-126-128; 132-134-136-140-142-144; 148-150-152-156-158-160; 164-166-168-172-174-176; 196-198-200-204-206-208; 212-214-216-220-222-224; 244-246-248-252-254-256; 260-262-264-268-270-272; and 276-278-280-284-286-288.

What is claimed is:

1. An isolated antibody or antigen-binding fragment thereof that specifically binds cell surface-expressed acid sensing ion channel 1 (ASIC1) (SEQ ID NO:401), as measured using a fluorometric imaging plate reader (FLIPR) assay, wherein the antibody or antigen-binding fragment comprises: (a) three complementarity determining regions (CDRs) of a heavy chain variable region (HCVR) having the amino acid sequence selected from the group consisting of SEQ ID NOs: 2, 34, 50, 66, 114, 130, 146, 162, 194, 210, 242, 258, and 274; and (b) three CDRs of a light chain variable region (LCVR) having the amino acid sequence selected from the group consisting of SEQ ID NOs: 10, 42, 58, 74, 122, 138, 154, 170, 202, 218, 250, 266, and 282.

2. The antibody or antigen-binding fragment of claim 1, wherein the antibody or antigen-binding fragment thereof specifically binds cell surface-expressed ASIC1 with an EC_{50} of 1 nM or less as measured using fluorescence activated cell sorting (FACS).

3. The antibody or antigen-binding fragment of claim 1, wherein the antibody or antigen-binding fragment thereof inhibits acid-induced, ASIC1-mediated ion currents in cells expressing human ASIC1.

4. The antibody or antigen-binding fragment of claim 3, wherein the antibody or antigen-binding fragment thereof inhibits acid-induced cellular calcium flux in cells expressing ASIC1 at pH of about 5.0 to about 6.0 with an IC_{50} of 6 nM or less as measured using a FLIPR assay.

5. The antibody or antigen-binding fragment of claim 3, wherein the antibody or antigen-binding fragment thereof inhibits acid-induced ion currents at pH of about 5.0 to about 6.0 with an IC_{50} of 10 nM or less as measured using a patch-clamp assay.

6. A pharmaceutical composition comprising the antibody or antigen-binding fragment of claim 3 and a pharmaceutically acceptable carrier or diluent.

7. An isolated antibody or antigen-binding fragment thereof that competes for binding to cell surface-expressed ASIC1 with a reference antibody comprising three heavy chain CDRs and three light chain CDRs of an HCVR/LCVR sequence pair selected from the group consisting of SEQ ID NOs: 2/10; 34/42; 50/58; 66/74; 114/122; 130/138; 146/154; 162/170; 194/202; 210/218; 242/250; 258/266; and 274/282, wherein said isolated antibody or antigen-binding fragment thereof comprises three heavy chain CDRs and three light chain CDRs of an HCVR/LCVR sequence pair comprising SEQ ID NOs: 34/42.

8. The antibody or antigen-binding fragment of claim 7, wherein the antibody or antigen-binding fragment thereof inhibits acid-induced ASIC1-mediated ion currents in cells expressing human ASIC1.

9. An isolated antibody, or antigen-binding fragment thereof, that specifically binds cell surface-expressed ASIC1 (SEQ ID NO:401), wherein the antibody or antigen-binding fragment comprises: (a) three complementarity determining regions (CDRs) of a heavy chain variable region (HCVR) having the amino acid sequence selected from the group consisting of SEQ ID NOs: 2, 34, 50, 66, 114, 130,

146, 162, 194, 210, 242, 258, and 274; and (b) three CDRs of a light chain variable region (LCVR) having the amino acid sequence selected from the group consisting of SEQ ID NOs: 10, 42, 58, 74, 122, 138, 154, 170, 202, 218, 250, 266, and 282.

10. The isolated antibody or antigen-binding fragment of claim 9, wherein the antibody or antigen-binding fragment comprises three heavy chain CDRs and three light chain CDRs of a HCVR/LCVR amino acid sequence pair selected from the group consisting of: SEQ ID NOs: 2/10; 34/42; 50/58; 66/74; 114/122; 130/138; 146/154; 162/170; 194/202; 210/218; 242/250; 258/266; and 274/282.

11. The isolated antibody or antigen-binding fragment of claim 9, wherein the antibody or antigen-binding fragment comprises HCDR1-HCDR2-HCDR3-LCDR1-LCDR2-LCDR3domains, respectively, selected from the group consisting of: SEQ ID NOs: 4-6-8-12-14-16; 36-38-40-44-46-48; 52-54-56-60-62-64; 68-70-72-76-78-80; 116-118-120-124-126-128; 132-134-136-140-142-144; 148-150-152-156-158-160; 164-166-168-172-174-176; 196198-200-204-206-208; 212-214-216-220-222-224; 244-246-248-252-254-256; 260-262-264-268-270-272; and 276-278-280-284-286-288.

12. An isolated antibody, or antigen-binding fragment thereof, that specifically binds cell surface-expressed ASIC1 (SEQ ID NO:401), wherein the antibody or antigen-binding fragment comprises: (a) three CDRs in a heavy chain variable region (HCVR) having the amino acid sequence selected from the group consisting of SEQ ID NOs: 2, 34, 50, 66, 114, 130, 146, 162, 194, 210, 242, 258, and 274; and (b) three CDRs in a light chain variable region (LCVR) having the amino acid sequence selected from the group consisting of SEQ ID NOs: 10, 42, 58, 74, 122, 138, 154, 170, 202, 218, 250, 266, and 282.

13. The isolated antibody or antigen-binding fragment of claim 12, wherein the antibody or antigen-binding fragment comprises three heavy chain CDRs and three light chain CDRs in a HCVR/LCVR amino acid sequence pair selected from the group consisting of: SEQ ID NOs: 2/10; 34/42; 50/58; 66/74; 114/122; 130/138; 146/154; 162/170; 194/202; 210/218; 242/250; 258/266; and 274/282.